

### **REMARKS**

Claims 1-88 are pending in the application. Claims 45 and 68 are cancelled hereby. Claims 37, 57-67, 69-73 and 84-89 are amended hereby. Claims 57-73 and 84-88 are rejected under 35 U.S.C. § 101. Claims 1-33 are rejected under the enablement requirement of 35 U.S.C. § 112, first paragraph. Claims 1-5, 7-10, 20-24, 26-30, 32-38, 40-43, 49-53, 55-61, 63-66, and 72-73 are rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,202,046 to Oshikiri et al. ("Oshikiri"). Claims 6, 11-15, 25, 31, 39, 44-48, 54, 62, 67-71, and 74-88<sup>1</sup> are rejected under 35 U.S.C. § 103(a) over Oshikiri in view of U.S. Patent No. 5,537,509 to Swaminathan et al. ("Swaminathan"). Claims 16-18 stand rejected under 35 U.S.C. § 103(a) over Oshikiri in view of Swaminathan and further in view of U.S. Patent No. 5,960,389 to Jarvinen et al. ("Jarvinen"). Claim 19 stands rejected under 35 U.S.C. § 103(a) over Oshikiri in view of Swaminathan and further in view of Jarvinen. Applicant traverses and respectfully requests reconsideration and withdrawal of all of the rejections.

First, Applicant thanks the Examiner for the withdrawal of the rejections under § 101 to claims 1-2, 4-6, 20-21, 34-35, 37, 39, and 49-50.

The Office Action rejects claims 57-73 and 84-88 under § 101 for the reasons set forth on pages 3, and 7-8 of the Office Action. Without conceding the propriety of the rejection, Applicant has adopted the Office Action's suggestions at page 3 by amending claims 57-73 and 84-88 to recite a "computer readable storage medium" instead of a recording medium. Applicant has also amended claims 57-58, 60, 62, and 72-73 to recite that the program is "executed by a processor." Applicant strongly urges that the amendments are clarifying amendments and do not in any way alter the scope of the claims. Applicant thanks the Examiner for the suggestions, and urges reconsideration and withdrawal of the rejections to claims 57-73 and 84-88.

The Office Action maintains the rejections of claims 1-33 under the enablement requirement of 35 U.S.C. § 112, first paragraph for the reasons set forth on pages 3-4 and 8-9. The

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<sup>1</sup> See page 15 of the Office Action for the rejection of claims 74-88.

Office Action alleges that the claims are a means-plus-function format and are single means claims. Applicant disagrees. Applicant respectfully commends attention to M.P.E.P. § 2181, which states:

A claim limitation will be presumed to invoke 35 U.S.C. § 112, sixth paragraph if it meets the following three-prong analysis:

(A) the claim limitations must use the phrase “means for” or “step for;”

(B) the “means for” or “step for” must be modified by functional language; and

(C) the phrase “means for” or “step for” must not be modified by sufficient structure, material, or acts for achieving the specified function.

**With respect to the first prong of this analysis, a claim element that does not include the phrase “means for” or “step for” will not be considered to invoke 35 U.S.C. § 112, sixth paragraph.**

... where a claim limitation meets the three-prong analysis and is being treated under 35 U.S.C. § 112, sixth paragraph, the Examiner will include a statement in the Office Action that the claim limitation is being treated under 35 U.S.C. § 112, sixth paragraph. **However, if a claim limitation does not use the phrase “means for” or “step for” that is, if the first prong of the three-prong analysis is not met, the Examiner will not treat such a claim limitation under 35 U.S.C. § 112, sixth paragraph ... a claim element that does not include the phrase “means for” or “step for” will not be considered to invoke 35 U.S.C. § 112, sixth paragraph.**

M.P.E.P. 2181 thus dictates that the Applicant, and not the Office, invokes 35 U.S.C. § 112, and that Applicant does so by using the language “means for” in the claim. The Office Action’s reference to *Seal-Flex, Inc. v. Athletic Track and Court Construction*, 172 F.3d 836, 850, 50 USPQ2d 1225, 1234 (Fed. Cir. 1999) is inapposite as 1) the Applicant is not attempting to invoke 35 U.S.C. § 112, sixth paragraph and 2) the case refers to the standard for “step-plus-function,” not means-plus-function. Accordingly, as Applicant has not invoked 35 U.S.C. § 112, sixth paragraph,

Furthermore, claims 1, 2, 4, and 6 recites the act of “smoothing,” for performing the decoding of the decoding circuit or unit. Claims 20 and 21 recites that the decoding unit “generates signals” by

“feeding an excitation signal” to a “synthesis filter” and that an excitation signal is “generated.” Thus the speech decoding circuit or unit of each of the independent claims are modified by sufficient structure, material, or acts for achieving the decoding function.

Applicant urges that claims 1-33 are not “means-plus-function” claims, and hence are improperly rejected as a “single means” claim. Applicant respectfully requests reconsideration and withdrawal of the rejections to claims 1-33 under 35 U.S.C. § 112, first paragraph.

The Office Action rejects claims 1-5, 7-10, 20-24, 26-30, 32-38, 40-43, 49-53, 55-61, 63-66, and 72-73 under § 102 over Oshikiri. For the reasons set forth in Applicant’s Amendment and Response date April 26, 2007 (“the April Response”), the entirety of which is incorporated by reference herein, Applicant traverses and respectfully requests reconsideration and withdrawal of the rejections thereto.

Turning first to independent claims 1, 34 and 57, each of the claims recite “smoothing at least one feature parameter representing spectral envelope characteristics.” Oshikiri fails to teach this limitation for the reasons set forth in the April Response at pages 29-30. At pages 4-5 the Office Action responds to the Applicant’s arguments, conceding that Oshikiri teaches smoothing a gain. However, the Office Action alleges that “because gain is a factor that contributes to the spectral shape of a speech signal, it is a feature parameter representing spectral envelope characteristics.” The Office Action also alleges that the smoothed gain parameters are applied to excitation parameters, citing to column 20, lines 26-35, thereby “effectively smoothing the excitation parameters.” Applicants disagree.

Neither the gain nor the excitation signal are a feature parameter representing the spectral envelope characteristics. Filter parameters (e.g., formants) are the features that represent spectral envelope characteristics. Figure 17 of Oshikiri, referenced by the Office Action, shows that filter parameters are not smoothed. To the contrary, decoded synthesis filter parameters from the synthesis filter decoder 410 are sent directly to the synthesis filter. For another example, Figure 48 of Oshikiri shows a typical CELP decoder. In Figure 48, a gain parameter is supplied to multipliers

1115 or 1117 from terminals 1116 or 1118. Yet the feature parameter representing spectral envelope characteristics is supplied to a perceptual weighting synthesis filter 1107. Thus the gain parameter is not a feature parameter representing spectral envelope characteristics.

Moreover, the Office Action's allegations that Oshikiri's "applying" a smoothed gain to an excitation parameter smoothes the excitation parameter is unwarranted. At column 20, lines 26-35, Oshikiri describes multiplying the smoothed gain and the excitation signal by a multiplier. Column 20, line 9 to column 21, line 21 of Oshikiri clearly describes and separates "smoothing" the decoded gain from the multiplication function.

Accordingly, Applicants urge that claims 1, 34, and 57 are presently in condition for allowance. As claims 22 and 28 depend from independent claim 1 and claim 51 depends from claim 34, Applicants urge that these dependent claims are also in condition for allowance. Accordingly, Applicants urge reconsideration and withdrawal of the rejections to these claims.

Independent claims 2, 35, and 58 are rejected for the reasons given on pages 10-11 of the Office Action.

First, addressing independent claim 2, the claim specifically requires that the voice-less part decoding unit change "a coefficient used to smooth at least one of the feature parameters, and decodes the speech signal in the voice-less period by smoothing at least one of the feature parameters with the changed coefficient." At page 5 the Office Action argues that Oshikiri discloses a gain parameter that is used to smooth a feature parameter, citing to column 20, lines 7-52 of Oshikiri. Applicant disagrees. Oshikiri is clear that a decoded gain parameter is supplied to a gain smoothing section, and the gain itself is smoothed. The gain parameter is not used to smooth a feature parameter.

Moreover, as explained in column 20, lines 53-54, which immediately follows the Office Action's citation, it states "in the embodiment shown in Fig. 17, gain smoothing is always performed by using the fixed constant  $\otimes$ . Insofar as Oshikiri teaches smoothing using a fixed

constant, Oshikiri does not teach that the voice-less part decoding unit “changes . . . a coefficient used to smooth at least one of the feature parameters” nor “decodes the speech signal in the voice-less period by smoothing at least one of the feature parameters with the changed coefficient,” as required by claim 2.

Claim 2 also recites “a voice-less part decoding unit which changes, according to an elapsed time from a time point when a transition occurs from the voice period to the voice-less period, a coefficient used to smooth at least one of the feature parameters.” Independent claims 35 and 58 each recite “smoothing at least one of the feature parameters according to an elapsed time from a time point when a transition occurs from the voice period to the voice-less period; and decoding the speech signal in the voice-less period by using the smoothed feature parameter.” The Office Action argues at page 5 that the gain parameter is “only changed based on a hangover period (Col. 16, Lines 8-39) because the gain of voice-less signals forcibly considered to be speech are unchanged (Fig. 17). After the hangover period (*i.e.*, based on an elapsed time from a transition from voice to voice-less), the signal is considered to be background noise, wherein the noise decoder changes the gain and decodes the voice-less period with the smoothed parameter (Col. 20, Lines 7-52 and Fig. 17), as is required by the claimed invention.” Applicant disagrees.

First, Applicant notes Oshikiri’s hangover processing and background noise classification cited by the Examiner is for use in a background noise **encoder**, not a background noise **decoder**. See Oshikiri at column 19, lines 4-62, Figs. 15 and 16. Moreover, the hangover processing section disclosed in column 16, lines 8-39 and Figs. 6 and 11 monitors the decision result from a background noise/speech classification apparatus and changes any decision result to forcibly regard background noise as a signal component in a **speech period** for an interval corresponding to a predetermined number of frames. Any decision would thereby encode parameters in this period as part of the **voice period**, not a voice-less period. Thus, at the time of decoding, as Oshikiri explains at column 20, lines 7-11:

The decoded parameters are input into a background noise decoder 404 and a background noise period by switching unit 403 which is switched in accordance with the background noise/speech decision

signal. **These parameters are input to a speech decoder 405 in a speech period.**

Hence Oshikiri's background noise decoder 404 at Figure 17, only smoothes signals regarded as in a voice-less period. Yet at column 16, the frames in the hangover period - the predetermined number of frames where a transition from speech period to non-speech period would occur - are forcibly regarded as in a speech period. Signals from the speech period (*i.e.*, voice period) are sent to Oshikiri's speech decoder 405, yet column 20 of Oshikiri expressly omits any discussion of the operation of the speech decoder ("Since the speech decoder 405 is irrelevant to the gist of the present invention, only the background noise decoder 404 will be described below"). Hence, this section of Oshikiri is silent on what happens to any signal processed by a hangover processing section, and is thereby silent on "smoothing" or "changing a coefficient" according to an elapsed time point from when a transition occurs from the voice period to the voice-less period," as required by claims 2, 35, and 58.

Finally, Applicant notes that Oshikiri's hangover processing is optional. Even assuming it could be combined with Oshikiri's voice-less part decoder, Oshikiri's voice-less part decoder would smooth the decoded gain parameter of a background signal regardless of whether it was encoded with or without hangover processing. Thus Oshikiri's smoothing function operates in the same way with or without hangover processing to encode a signal. Accordingly Oshikiri's background noise decoder does not smooth or change a coefficient "**according to an elapsed time point from when a transition occurs from the voice period to the voice-less period,**" as required by claims 2, 35, and 58.

Applicants respectfully submit that independent claims 2, 35, and 58 are presently in condition for allowance and urge reconsideration and withdrawal of the rejections thereto. As claims 3, 7, 8, 10, 23, 29, 36, 40-41, 43, 52, 59, 63-64 and 66 each ultimately depend from independent claims 2, 35, and 58, the Applicants urge that these claims are in condition for allowance as well and urge reconsideration and withdrawal of the rejections thereto.

As for independent claims 4, 37, and 60, independent claim 4 recites “a voice-less part decoding unit which changes a value of a coefficient used to smooth at least one of the feature parameters according to the feature parameters and decodes a speech signal and a voice-less period by smoothing at least one of the feature parameters with the changed value of the coefficient.” Independent claims 37 and 60 recite “smoothing at least one of the feature parameters according to the [received] feature parameters, wherein the smoothing changes a coefficient used to smooth at least one of the received feature parameters according to information representing whether a new feature parameter is transmitted or not.” As explained above with respect to claim 2, Oshikiri does not show a voice-less part decoding unit which changes a coefficient. Accordingly, Applicant respectfully submits that independent claims 4, 37, and 60 are presently in condition for allowance and urge reconsideration and withdrawal of the rejections thereto. As claims 5, 9, 24, 30, 38, 53, 61, and 65 each ultimately depend from independent claims 4, 37 and 60, the Applicants urge that these claims are in condition for allowance as well and urge reconsideration and withdrawal of the rejections thereto.

Independent claims 20 and 21 recite “a voice-less part decoding unit which generates signals in the voice-less period by feeding an excitation signal composed of plural types of signals to a synthesis filter and the voice-less period, wherein the voice-less part decoding unit comprises a weighting coefficient determining unit which determines a weighting coefficient used in a weighted sum operation of the plurality of types of signals in the voice-less period.” Independent claims 49-50 and 72-73 each recite “determining a weighting coefficient used to generate an excitation signal of the voice-less period by performing a weighted sum operation of plural types of signals” and “generating the excitation signal based on the weighting coefficient.” Oshikiri does not teach or suggest these limitations.

Page 6 of the Office Action argues, “that Oshikiri fails to teach that an excitation signal is composed of a plurality of types of signals and that ‘the voice-less part decoding unit comprises a weighting coefficient determining [unit] (sic) which determines a weighting coefficient used in a weighted sum operation of the plurality of types of signals.” With all due respect, the Office Action misunderstands the Applicant’s argument. Applicant does not deny that Oshikiri’s excitation signal

can be composed of a plurality of types of signals. However, Applicant urges that simply because an excitation signal can be composed of a number of signals, the simple act of multiplying the excitation signal and a smoothed gain by a multiplier, as Oshikiri teaches at column 20, lines 26-35, does not result in a weighted sum operation. A weighting coefficient used in a weighted sum operation gives weight to some elements of the sum – “plural types of signals” – more than others when performing the summation operation. Page 25, lines 10-29 and page 26, lines 25-29 of the present specification show a non-limiting example of a weighted sum operation: the voice-less part examining circuit changing the calculation method of coupling coefficients of the pitch signal, the pulse signal, and the random signal in a mixing circuit (see Applicant’s April Response). In the example, changing the coupling coefficient of the pitch signal, pulse signal, and random signal in the mixing circuit weights the respective signals differently.

As cited by the Office Action, Oshikiri discloses one embodiment where an adaptive vector gain and a stochastic vector gain are added to generate an excitation signal (column 37, lines 6-24 and Fig. 52), and separately shows another embodiment which multiplies a smoothed gain and an excitation signal by a multiplier (column 20, lines 25-29 and Fig. 17). Nothing in Oshikiri teaches how the elements of the excitation signal in Fig. 52 would be multiplied by the smoothed gain in Figure 17, much less how the elements of the excitation signal in Fig. 52 would be weighted differently by the multiplier.

To the contrary, the different physical configurations of Oshikiri’s embodiments at Fig. 52, where the added excitation signal is supplied directly to a synthesis filter without further processing, and the system in Fig. 17, where the excitation signal, gain smoothing, and filter coefficients are processed separately, do not combine to form voice-less part decoding unit that comprises a weighting coefficient determining unit which determines a weighting coefficient used in a weighted sum operation of the plurality of types of signals, as required by claims 20-21, 49-50, and 72-73. As claims 26, 27, 32, 33, 55, and 56 all depend from the above-mentioned independent claims, Applicants urge that these claims are in condition for allowance as well and urge reconsideration and withdrawal of the rejections thereto.



Claims 6, 11-15, 25, 31, 39, 44-48, 54, 62, 67-71, and 74-88 are rejected under § 103 over Oshikiri in view of Swaminathan. With respect to independent claims 6, 39, and 62, at page 7 the Office Action now adds that claims 6, 39, and 62 are “traversed” for reasons similar to claims 2, 35, and 58. At page 14, the Office Action rejects claims 6, 39, and 62 alleging that “Oshikiri discloses the background noise decoder as applied to claims 1 and 34;” the deficiency of this rejection is amply discussed in Applicant’s April Response. Applicant respectfully urges that claims 2, 35, and 58, like claims 1 and 34, are separate independent claims with different limitations or otherwise having differing scope. With all due respect, the addition of more separate independent claims as a basis for the present rejection renders the rejection unclear. Accordingly, Applicant respectfully urges that the Office Action consider each claim on its own merits.

First, independent claim 6 recites “a voice-less part decoding unit which changes a value of a coefficient used to smooth at least one of the feature parameters.” For claim 6, as explained above with respect to independent claim 2, Oshikiri’s system does not change the value of its coefficient to smooth gain. Moreover, in Oshikiri if any signal gave an indication of a voice-less period, Oshikiri’s voice-less part decoding unit would simply smooth the gain using the same coefficient. Oshikiri’s voice-less part decoding unit does not change a value of a coefficient used to smooth at least one of the feature parameters according to information representing whether a new feature parameter is transmitted or not, as required by claim 6.

Claims 6, 39, and 62 recite changing a value of a coefficient or smoothing “according to information representing whether [a new] the feature parameter[s] are [is] transmitted or not.” At page 14, the Office Action admits that Oshikiri does not teach this invention, turning to column 4, lines 30-39 and column 5, lines 11-23 of Swaminathan for this rejection.

At page 7 the Office Action argues that Swaminathan “additionally teach gradually adjusting (*i.e.*, smoothing) a weighting factor that changes spectral slope within a voice inactivity (*i.e.*, voice-less),” citing to column 5, line 47 to column 6, line 28. However, this disclosure is teaching a comfort noise generator, not smoothing of “a received feature parameter.” Indeed at column 6, lines 23-27 Swaminathan explains that the weighting factor changes the mix of the

loudness level and spectral shape of the comfort noise, not a received feature parameter. Thus, with all due respect, not only is Swaminathan's comfort noise generator not a "voice-less part decoding unit," but it does not "decode[] the speech signal in the voice-less period by smoothing at least one of the feature parameters with the changed value of the coefficient," as required by claim 6, or decode "the speech signal in the voice-less period by using the smoothed feature parameter," as required by claims 34 and 62.

Dependent claims 11-15, 25, 31, 39, 44-48, 54, 67-71, and 74-88 ultimately depend from the independent claims of the present invention. As nothing in Oshikiri or Swaminathan cures the deficiency of the references as applied to the independent claims, Applicant urges that these claims are in condition for allowance and further urges reconsideration and withdrawal of the rejections thereto.

Claims 16-19 are rejected under § 103 as unpatentable over Oshikiri in view of Swaminathan and further in view of Jarvinen. These claims depend from independent claims 1-2, 4, and 6. Nothing in Swaminathan, Oshikiri or Jarvinen cures the deficiency of the Swaminathan and Oshikiri references alone or in combination, as applied to the independent claims. Accordingly, Applicant urges that these claims are in condition for allowance and urges reconsideration and withdrawal of the rejections thereto.

In view of the above amendment, Applicant believes the pending application is in condition for allowance.

No fee is believed to be due for this Amendment. Should any fees be required, please charge such fees to Deposit Account No. 50-2215.

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